

ABSTRACT

A new method for the removal of environmental compounds from gaseous streams, in particular, flue gas streams. The new method involves first oxidizing some or all of the acid anhydrides contained in the gas stream such as sulfur dioxide (SO_2) and nitric oxide (NO) and nitrous oxide (N_2O) to sulfur trioxide (SO_3) and nitrogen dioxide (NO_2). The gas stream is subsequently treated with aqua ammonia or ammonium hydroxide which captures the compounds via chemical absorption through acid-base or neutralization reactions. The products of the reactions can be collected as slurries, dewatered, and dried for use as fertilizers, or once the slurries have been dewatered, used directly as fertilizers. The ammonium hydroxide can be regenerated and recycled for use via thermal decomposition of ammonium bicarbonate, one of the products formed. There are alternative embodiments which entail stoichiometric scrubbing of nitrogen oxides and sulfur oxides with subsequent separate scrubbing of carbon dioxide.